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EXAMINER

SAAD, ERIN BARRY

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/589,209
Filing Date: May 14, 2007
Appellant(s): LARCHER ET AL.

Scott Cummings
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9/22/2009 appealing from the Office action mailed 5/11/2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6171572	Aozasa	1-2001
2003/0224931	Yamamoto et al.	12-2003
5063192	Murakami et al.	11-1991

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 20-30, 39-41 and 44-45 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Aozasa (US6171572).

In regards to claims 20-27 and 39-41, Aozasa teaches a zirconium – cerium composite oxide and a co-catalyst for purifying exhaust gas comprising Zr/Ce weight ratio of 51-95:49-5 and optionally further comprising one or more additives selected

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from yttrium, scandium, lanthanum, praseodymium, neodymium, samarium, europium, gadolinium, magnesium, calcium, barium, aluminum, titanium, and hafnium in the amount of 0.1-20% by weight, and where said composite oxide has a specific surface area of not smaller than $50 \text{ m}^2/\text{g}$ and is capable of maintaining a specific surface area of at least $20 \text{ m}^2/\text{g}$ after calcination at 1100 C for 6 hours (see col 3, ln 23-38).

In regards to the claim limitation, "consisting essentially of" limits the scope of a claim to the specified materials "that do not materially affect the basic and novel characteristics" of the claimed invention, and it has been held that the use of well known additives, would not materially affect the basic and novel characteristics of a claimed invention (see MPEP 2111.03). Aozasa teaches the use of cerium oxide is a well known additive or co-catalyst having the properties of purifying noxious components in exhaust gases (see col 1, ln 15-34). It is deemed that the addition of cerium oxide would have a well known and beneficial effect, and therefore would not materially affect the basic and novel characteristics of the claimed invention.

The reference further teaches specific embodiments, comprising zirconium, cerium and lanthanum oxide, which have a specific surface area of over $70 \text{ m}^2/\text{g}$ after 900 C calcination for 6 hours, over $50 \text{ m}^2/\text{g}$ after 1000 C calcination for 6 hours, and over $20 \text{ m}^2/\text{g}$ after 1100 C for 6 hours (see examples 1-8, Table 1). Although Aozasa does not teach the specific surface area of the material after a 10 hour calcination at 1000 C , it teaches values which are clearly equivalent to our better than required by the instant claims. In fact, the reference teaches specific surface areas of over $24 \text{ m}^2/\text{g}$ for 6 hour calcination at 1100 C which is considerably higher than that required by claims

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24 and 25. It is therefore concluded, that the composition as taught by Aozasa would inherently possess the properties as required by claims 20-27 and 39-41.

In the alternative, as the reference teaches the same composition and substantially the same method of making, one would expect the material to have specific surfaces areas similar to that claimed. The Patent and Trademark Office can require Applicant to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on Applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best*, Bolton, and Shaw, 195 U.S.P.Q. 431 (CCPA 1977).

In regards to claim 28, Aozasa teaches additive components which do not exceed 50% by weight. See for instance, Examples 1-8, which each teach zirconium oxide to comprise at least 65% of the composition by weight (see Table 1).

In regards to claims 29-30, Aozasa teaches compositions comprising zirconium oxide and additives of cerium oxide and lanthanum oxide, teaches overlapping ranges of additive addition, and specific embodiments including additives in the amount of 34.2 and 25.1% by weight (see examples 1 and 2 respectively) which read on the required ranges.

In regards to claims 44-45, Aozasa teaches a material which forms a partial or substantial composite oxide or a solid solution (see col 4, ln 10-18). It is therefore considered that the reference meets the instant claims. In the alternative, as the reference teaches substantially the same materials and method of forming the material, one would expect the material to have a structure similar to that claimed. Thus, it would necessarily follow that the material as taught by Aozasa would inherently or would necessarily form a solid solution and/or mixture of different phases as required by claims 44 and 45, respectively.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 31, 36-38 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aozasa (US6171572).

In regards to claim 31, Aozasa is silent to the porosity of the composition, however since the reference teaches substantially the same materials and method of forming the material, one would expect the material to have a pore size similar to that claimed. Thus, it would follow that the material as taught by Aozasa would inherently or would necessarily possess the pore size as required by claim 31.

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In regards to claims 36-38, Aozasa teaches a composition as required by claim 20 (see rejection above) and teaches that such a composition is useful as a co-catalyst in catalyst systems further comprising metals such as platinum, palladium, or rhodium and methods of treating exhaust gases with said catalyst systems. It would have been obvious to one of ordinary skill in the art, in view of the teachings of Aozasa to form a catalyst system comprising the zirconium, cerium, lanthanum composite oxide further comprising a metal such as Pt, Pd, or Rh. The addition of metals such as Pt, Pd, and Rh to a zirconium composite oxide support is well known in the art (see for example (US20030224931)). It would have been further obvious to one of ordinary skill in the art to use such a catalyst system to treat exhaust gases, in order to enhance the properties of the catalytic metals, and to increase the industrial applicability of the invention.

In regards to claim 42, the reference teaches a catalyst material further comprising additional catalyst metals such as platinum (see above); it would necessarily follow that said catalyst material serve as a catalyst support for the additional catalyst metals. In effect, Aozasa teaches a catalyst material which is, or in the alternative, would be obvious to one of ordinary skill in the art to utilize as a catalyst support, in order to enhance the catalytic properties of a catalyst system, thus increasing the industrial applicability of the invention.

5. Claims 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aozasa (US6171572) in view of Yamamoto et al. (US2003/0224931).

In regards to claims 33-35, Aozasa teaches a method of making a catalyst material comprising steps for forming a mixture of zirconium, lanthanum, and cerium nitrates, adding to the mixture deionized water and ammonia (a basic compound), forming a precipitate, heating said precipitate at 500 C to form a gel, and further calcining said gel at 900, 1000, and 1100 C (see example 1 and comparative example 1). Aozasa fails however, to teach the addition of a surfactant or carboxylic acid compound during the preparation as required by claim 33.

Yamamoto et al. ("Yamamoto") teaches a method of making a zirconium-cerium oxide catalyst material comprising steps of forming an aqueous mixture of cerium nitrate and zirconium oxynitrate, adding hydrogen peroxide and ammonia, forming a precipitate, adding cationic and anionic surfactants, and calcining the resultant mixture (see Embodiment 1). Yamamoto further teaches an embodiment in which a mixture of a liquid component and decomposed zirconium and cerium compounds are heated, a surfactant is added to form a homogeneous precursor, and followed by a calcination (see [0066]-[0068]).

It would have been obvious to one of ordinary skill in the art to modify the teachings of Aozasa to add a surfactant during the preparation of the zirconium oxide containing material. The use of surfactants in the preparation of catalyst or catalyst supports is well known in the art, in order to direct or enhance the structure of resulting product. In addition, Yamamoto teaches that the use of a suitable surfactant will improve the diffusion properties of the additive particles (see [0054]). Furthermore, it would have been obvious to one of ordinary skill in the art to modify the teachings of

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Aozasa in view of Yamamoto to perform the addition of a surfactant material before or after a heating step in order to modify the effects of the surfactant on the structure of resulting material.

6. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aozasa (US6171572, of record) in view of Murakami et al. (US5063192).

In regards to claim 43, Aozasa teaches a composition as required by claim 20 (see above). Murakami et al. teaches a honeycomb substrate having a wash coat applied, said wash coat solution comprising zirconium nitrate, lanthanum nitrate, and aluminum oxide, and boehmite (see for example col 7, ln 8-20).

It would have been obvious to one of ordinary skill in the art to utilize the composition as taught by Aozasa comprising zirconium and lanthanum in a wash coat solution for application to a substrate such as a honeycomb structure as taught by Murakami. One of ordinary skill in the art would have been motivated to make such a modification in order to produce a catalyst having a high surface area and enhanced catalytic properties, thus increasing the industrial applicability of the invention. One of ordinary skill would have a reasonable expectation of success with such a modification.

(10) Response to Argument

7. The Appellant argues that the transitional phrase “consisting essentially of” limits the scope of a claim to the specified constituents, as well as those that did not materially affect the basic and novel characteristics of the claimed invention. The Appellant

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argues that prior art, Aozasa, teaches compositions limited to a composite mixed oxide composed of both zirconium and cerium in substantial amounts.

The claim limitation, "consisting essentially of" limits the scope of a claim to the specified materials "that do not materially affect the basic and novel characteristics" of the claimed invention, and it has been held that the use of well known additives, would not materially affect the basic and novel characteristics of a claimed invention (see MPEP 2111.03). Aozasa teaches the use of cerium oxide is a well known additive or co-catalyst having the properties of purifying noxious components in exhaust gases (see col 1, ln 15-34). It is deemed that the addition of cerium oxide would have a well known and beneficial effect, and therefore would not materially affect the basic and novel characteristics of the claimed invention. Thus, it is the Examiner's position that the composition as taught by Aozasa is considered to meet the instant claim.

8. The Appellant argues that cerium oxide materially alters the fundamental catalytic properties.

While Aozasa states that cerium oxide purifies noxious components in exhaust gas in the prior art, the Appellant has not provided evidence that the cerium oxide would materially alter the present invention as claimed.

9. The Appellant argues that Aozasa does not teach the claimed specific surface area after ten hours of calcination at 1000 C.

Aozasa discloses embodiments comprising zirconium, cerium and lanthanum oxide, which have a specific surface area of over 70 m²/g after 900 C calcination for 6 hours, over 50 m²/g after 1000 C calcination for 6 hours, and over 20 m²/g after 1100 C

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for 6 hours (see examples 1-8, Table 1). Although Aozasa does not teach the specific surface area of the material after a 10 hour calcination at 1000 C, it teaches values which are clearly equivalent to our better than required by the instant claims. In fact, the reference teaches specific surface areas of over $24 \text{ m}^2/\text{g}$ for 6 hour calcination at 1100 C which is considerably higher than that required by claims 24 and 25. It is therefore concluded, that the composition as taught by Aozasa would inherently possess the properties as required by claims 20-27 and 39-41.

In the alternative, as the reference teaches the same composition and substantially the same method of making, one would expect the material to have specific surfaces areas similar to that claimed.

10. The Appellant argues that claims 33-35 rejected over Aozasa in view of Yamamoto et al. would not be obvious to one of ordinary skill in the art for at least the reasons set forth for above claim 20.

This is not found persuasive, as the arguments regarding claim 20 are not found persuasive, as detailed above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

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Respectfully submitted,

/ERIN B SAAD/

Examiner, Art Unit 1793

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